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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GREGOR POPP

Appeal 2011-005382
Application 12/338,589
Technology Center 2800

Before RICHARD E. SCHAFER, SALLY G. LANE, and JOHN G. NEW, *Administrative Patent Judges.*

NEW, *Administrative Patent Judge*.

DECISION ON APPEAL

SUMMARY

Appellant files this appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1-24. Specifically, claims 1-7, 9-11, 13-18, 20, 21, 23, and 24 stand rejected as unpatentable under 35 U.S.C. § 103(a) as being obvious over the combination of Ames et al. (US 5,371,814, December 6, 1994) ("Ames") and Basavanhally et al. (US 5,185,846, February 9, 1993) ("Basavanhally").

Claims 8, 12, 19, and 22 stand rejected as unpatentable under 35 U.S.C. § 103(a) as being obvious over the combination of Ames, Basavanhally, and Thiele et al. (US 2004/0017984 Al, January, 29, 2004) ("Thiele").

We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

NATURE OF THE CLAIMED INVENTION

Appellant's invention is directed to a rotating data transmission device for optical signals comprising two collimator arrangements for coupling light-waveguides, the collimator arrangements being rotatable relative to each other, and a derotating element being interposed in a light path between the collimator arrangements. At least one collimator arrangement comprises a lens system with a micro-lens array, and a light-waveguide holder firmly mounted to the micro-lens array with an intermediate space between the holder and the micro-lens array. At least one light-waveguide for supplying or collecting light to or from a micro-lens is fastened to both the micro-lens array and to the holder to prevent

bending loads with attendant shifts of a mode field from acting upon the light-waveguide between the holder and the micro-lens array. Abstract.

GROUPING OF CLAIMS

Claim 1 is representative of the claims on appeal. App. Br. 5, 10. Claim 1 recites:

> 1. An optical rotating data transmission device, comprising:
>
> a first collimator arrangement for coupling first light-waveguides;
>
> a second collimator arrangement for coupling second light-waveguides rotatable relative to the first collimator arrangement about a rotation axis; and
>
> a derotating optical element located in a light path between the first collimator arrangement and the second collimator arrangement;
>
> wherein the first collimator arrangement and the second collimator arrangement comprises a substrate having a front surface on which micro-lenses are formed, and an opposite rear surface through which light-waveguides are led for optical coupling with the micro-lenses, and a light-waveguide holder connected to the substrate;
>
> wherein the light-waveguide holder has a holding portion extending parallel along and at a given distance from the rear surface; and
>
> wherein at least one light-waveguide optically coupled to a micro-lens is connected both to the substrate and the holding portion.

App. Br. 11.

ISSUES AND ANALYSES

Issue 1

Appellant argues that the Examiner erred in finding that the combination of Ames and Basavanhally teaches or suggests the limitation of claim 1 reciting "wherein the first collimator arrangement and the second collimator arrangement comprises a substrate having a front surface on which micro-lenses are formed…." App. Br. 6-7. We therefore address the issue of whether the Examiner so erred.

Analysis

Appellant argues that Ames explicitly teaches mounting lenses 54 within apertures of pieces 12 and 26, rather than forming lenses on one surface of the substrate as required by claim 1. App. Br. 6 (citing Ames, col. 7, ll. 53-55). According to Appellant, the teachings of Ames require that the lenses 54 be "mounted in" aperture 52, since they are first coupled to the "end face" of the fiber transmission optical fibers by an epoxy cement. App. Br. 6 (citing Ames, col. 7, ll. 59-65).

Appellant argues further that Ames teaches that the spacing between the terminal ends of optical fibers 53 and corresponding lenses 54 should be adjustable so as to properly adjust the amount of collimation and beam focus. App. Br. 6 (citing Ames, col. 11, ll. 3-45; Fig. 1). Appellant contends that, if the beam is not properly optically coupled, the optic fiber is detached from the lens and the lenses are cleaned and polished to a shorter length prior to reattachment of the optic fiber. App. Br. 6 (citing Ames, col. 11, ll. 22-32, 35-44). Therefore, argues Appellant, Ames

teaches away from the present claims by requiring that the lenses be separate so they can be polished and re-secured through a repeated process to the lens and fiber joints 18, 28. App. Br. 6. Appellant also argues that joints 18, 28 must be separate and apart from the array piece substrates, not on which they are formed (as claimed), but rather in which they are mounted. App. Br. 6-7. Appellant thus argues that because Ames teaches that lens 54 is polished or ground prior to insertion into apertures 52, lens 54 cannot be the claimed micro-lens array formed on a front surface of the substrate. App. Br. 7.

The Examiner responds that Ames teaches that types of lenses other than the illustrated rod-shaped graded-index ("GRIN") lenses can be employed in the disclosed invention. Ans. 10 (citing Ames, col. 9, ll. 30-35). The Examiner particularly notes that Ames teaches that aspherical lenses can be used which, when compared to rod-shaped GRIN lenses, have the benefit of reducing optical loss. *Id.* The Examiner finds that Ames provides an illustration of one such aspherical lens disposed on a rod-shaped GRIN lens. Ans. 10 (citing Ames, Fig. 3). The Examiner therefore finds that the teachings of Ames contemplate embodiments wherein such an aspherical lens can be used by itself, i.e., without any GRIN lens. Ans. 10. The Examiner finds that since the lens size/diameter can exceed that of the optical fibers, the lens would necessarily have to be placed on the front surface of the substrate (56) and that the fibers (53) would have to extend to the front surface of the substrate (through respective holes). Ans. 10-11.

We are persuaded by the Examiner's reasoning. As an initial matter, Appellant's argument concerning the detachability and polishing of the

lenses, as taught by Ames, is inapposite. The language of Appellant's claims say nothing with respect to the attachment of the optic fibers to the micro-lenses beyond the fact that they are coupled. Appellant concedes that Ames teaches that the optic fibers are coupled to the GRIN lenses. App. Br. 6 (citing Ames, col. 11, lines 35-44). We therefore need not address that argument further.

Moreover, we disagree that Ames teaches away from the disputed limitation. A reference may be said to teach away when "a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). Appellant has adduced no evidence suggesting that the teachings of Ames would discourage or divert an artisan of ordinary skill from the requirements of the disputed limitation. Appellant merely argues that Ames does not teach "a substrate having a front surface on which micro-lenses are formed" but teaches rather that the lenses are inserted into apertures in the substrate. App. Br. 6-7. We find that this does not rise to the measure of teaching away from the disputed limitation.

Ames teaches cylindrical lenses (54) inserted into forward-facing apertures (52) in the substrate (56). Ames, col. 7, ll. 53-57. Ames depicts the forward face of these GRIN lenses in Figure 1 as being flush with the forward surface of the substrate. *See* Ames, Figure 1. We agree with the Examiner, however, that Ames teaches that other types of lenses may alternatively be employed, including an aspherical-type collimation lens. Ames, col. 9, ll. 30-35; *see* Fig. 3. Examining Figure 3, which depicts an

aspherical lens coupled at its base to a cylindrical GRIN lens, we find that a person of ordinary skill would likely position the aspherical lens such that the base of the aspherical lens would be flush with the forward surface of the substrate. However, we agree with the Examiner that Ames teaches that an aspherical lens alone may be used in the disclosed invention; Ames teaches that "[t]he lenses preferably are gradient index rods …. However, other types of lenses which may be employed include an aspherical type miniature collimation lens." Ames, col. 9, ll. 25-35. The teachings of Ames do not therefore teach or suggest that the latter lens must be combined with the former.

Given the hemispherical shape of the aspherical lens taught in Ames' Figure 3, we conclude that a person of ordinary skill in the art would have found it obvious to attach these aspherical lenses to the forward face of the substrate, over the aperture, and to couple the lens with a fiber optic waveguide through the aperture. We therefore conclude that the Examiner did not err in determining that the cited prior art references teach or suggest the disputed limitation.

Issue 2

Appellant argues that the Examiner erred in combining Ames and Basavanhally, which also teach away from the limitation of claim 1 reciting a "light-waveguide holder has a holding portion extending parallel along and at a given distance from the rear surface." App. Br. 9. We therefore address the issue of whether the Examiner so erred.

Analysis

Appellant argues that Ames does not teach or suggest a holder that is spaced from the rear surface of a substrate, such as substrate 56, 57. App. Br. 9. Appellant also argues that although Basavanhally describes a holder spaced from plate 15, plate 15 is not a substrate on which a micro-lens array is formed on the front surface. *Id.* Instead, according to Appellant, any lenses taught by Basavanhally must be spaced and separate from plate 15 in order to gain access and grind the fiber ends 39. *Id.*

The Examiner responds that Basavanhally teaches a holding portion extending parallel along and at a given distance from the rear surface; and wherein at least one light-waveguide is inside a through bore hole and is connected both to the substrate and the holding portion. Ans. 6 (citing (Basavanhally, col. 3, ll. 40-43).

We are not persuaded by Appellant's reasoning. As an initial matter, the Examiner's rejection of claim 1 is based on the combination of the cited prior art references, rather than on an individual reference. *See In re Keller*, 642 F.2d 413, 426 (C.C.P.A. 1981) ("[O]ne cannot show non-obviousness by attacking references individually where … the rejections are based on combinations of references").

We agree with the Examiner that Basavanhally teaches the disputed limitation. Figure 3 of Basavanhally depicts a substrate 15 and, spaced parallel to its rear surface, a holder 14, which is connected 19 to the substrate. We have explained *supra* our finding that Ames teaches or suggests the limitation of a substrate upon which a micro-lens array is positioned on its forward surface. We therefore conclude that the Examiner

did not err in finding that the cited prior art references teach or suggest the disputed limitation.

DECISION

The Examiner's rejection of claims 1-24 under 35 U.S.C. § 103(a) is affirmed.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

msc